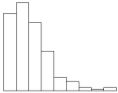
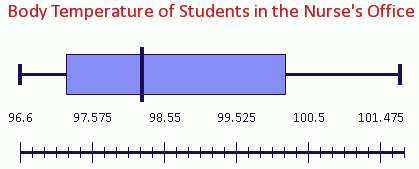
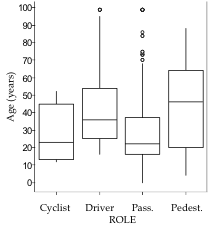
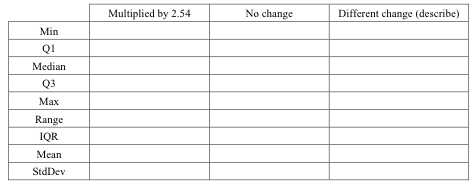
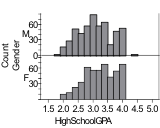
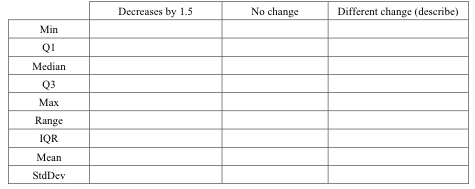
Name: KEY

Date:

1. Which are the best statistics to use to describe the center and spread of data in this histogram? (2pts)  
   1. Center: mean; spread: standard deviation
   2. Center: standard deviation; spread: mean
   3. Center: median, spread: standard deviation
   4. **Center: median; spread: IQR**
   5. Center: median; spread: range
   6. Center: mean; spread: IQR
2. Which is true about the weights of people shown in these parallel boxplots? (3pts)  
     
   1. The third quartile of group 1 is less than the median of group 2.
   2. The IQR of group 1 is less than the IQR of group 2.
   3. **Each person in group 2 is heavier than those in the lighter half of group 1.**
   4. The weights in group 2 are skewed to the left.
3. The body temperature of students is taken each time a student goes to the nurse’s office. The five-number summary for the temperatures (in degrees Fahrenheit) of students on a particular day is:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Min | Q1 | Median | Q3 | Max |
| 96.6° | 97.85° | 98.25° | 98.6° | 101.8° |

* 1. Sketch a box and whisker plot for this data: (3pts)  
     
  2. Would you expect the mean temperature of all students who visited the nurse’s office to be higher or lower than the median? Explain. (3pts)  
     *The mean temperature of all students would probably be higher than the median because the five-number summary shows that the data appear skewed right.*
  3. After the data were picked up in the afternoon, three more students visited the nurse’s office with temperatures of 96.7°, 98.4°, and 99.2°. Were any of these students outliers? Explain. (3pts)  
       
     *The IQR = 98.6 – 97.85 = 0.75.  
     0.7x (1.5) = 1.125  
       
     97.85 – 1.125 = 96.725 🡪 96.7 is an outlier.  
     98.6 + 1.125 = 99.725 🡪 there is no new high outlier*

1. The side-by-side boxplots show the age of people involved in accidents according to their role in the accident. (2pts each)
   1. Which role involved the youngest person?  
      *Passenger*
   2. What is the age of the youngest person?  
      *less than 1 year old*
   3. Which role had the lowest median age?  
      *Passenger*
   4. What is that age?  
      *21 years old*
   5. Which role had the smallest range of ages?  
      *Cyclist*
   6. What is that range?  
      *40 years*
   7. Which role generally involves the oldest people? Explain  
      *Pedestrian. While the oldest person involved in an accident is not a pedestrian, the median age for pedestrians is almost 45 years, while the median age in the other groups are between 22 and 35 years old. The oldest 50% of the Pedestrian group, from 45 to 87 years, is generally older than the youngest 75% of two groups – Cyclist and Passenger, and only the Driver group has any of its middle 50% as old. The Driver and Passenger groups have a few people older than the Pedestrian group.*
2. Suppose we measured each person’s height in inches from the floor to the top of the person’s head. How each of the following summary statistics of height data would change if we converted each measurement to centimeters by multiplying by 2.54? For each statistic, check “multiplied by 2.54”, “no change,” or, if it changes some other way, describe that change. (1pt each)  
   
3. Suppose we made a mistake with our ruler and accidentally have been recording heights that are 1.5 inches greater than they really are. If we now subtract 1.5 inches from everyone’s height, how will each summary statistic change when compared to the original data? (1pt each)  
   
4. One thousand students from a local university were sampled to   
   gather information such as gender, high school GPA, college GPA,   
   and total SAT scores. The results were used to create histograms   
   displaying high school GPA’s for both males and females.   
   Compare the grade distribution of males and females. (6pts)  
     
   *The distributions of high school GPA for both males and females are  
   left-skewed, and both distributions appear to be centered at a GPA of  
   about 3.0. The distribution of male GPA appears slightly more spread  
   out than the distribution of female GPA.*
5. Imagine there was an error in the GPA calculations above so that every student’s GPA was actually 0.2 points less. Describe what measures of center and spread would change and what would NOT change if the histograms above were redrawn with the corrected data. (3pts)  
     
   *Change: Mean  
    Median  
    Quartiles  
    Minimum  
    Maximum  
     
   Not Change: IQR  
    Standard deviation  
    Range*